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AFFSE REPORT 1/78

LABORATORY EVALUATION OF AUSTRALIAN RATION PACKS (U)

C. H. FORBES-EWAN

SUMMARY

Results of analyses of ration pack items of the 1975/76 packaging programme are presented. Energy values are reported in Kilojoules.

Some of the rations have become nutritionally unbalanced, particularly with respect to vitamin C and protein content. Total energy values of some rations are also below the recommended level. (U)

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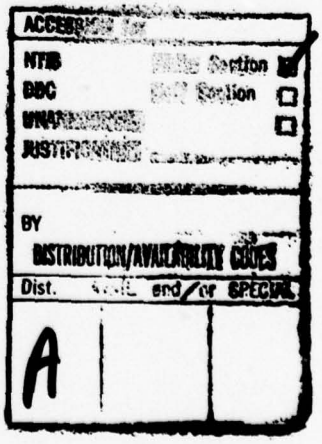

LABORATORY EVALUATION OF AUSTRALIAN RATION PACKS

by

C. H. Forbes-Ewan

INTRODUCTION

Previous reports (AFFSE 1970-1976) have given the results of analyses of ration packs from preceding packaging programmes. This report details the laboratory evaluation of samples from the 1975/76 packaging programme with the exception of the Combat Ration 10 Man.

Each ration component was analysed for moisture, fat, ash, protein, vitamin B_1 (thiamine), vitamin C (ascorbic acid) and salt (NaC1). A value of carbohydrate content was calculated (by "difference"). This was used with the protein and fat results to calculate total energy value of each component and the proportion of energy derived from protein, fat and carbohydrate. Energy values are reported in Kilojoules (1 Kilocalorie = 4.186 Kilojoules).

The contents of the various ration packs are given in the Annexes, together with their chemical evaluation. In Annex E the energy distribution patterns are shown.

In the preceding report of ration evaluation (AFFSE 1/76), several suggestions were made to improve the nutritional and weight characteristics of the rations. In the discussion below, these suggestions will again be looked at and there will be further comment on the nutritional status of the rations.

METHODS

The methods used for chemical analyses are detailed in a previous report (AFFSE 4/70).

RESULTS

A summary of the results is given below with full details in Annexes A-E.

The recommended dietary allowances (Thomas and Corden, 1970) are as follows: For a "reference man" with a grade II level of physical activity (applicable to infantry), total energy intake should be about 13,400 kJ; vitamin B_1 allowance is 1.3 mg; vitamin C allowance is 30 mg; protein intake should be no less than 70 g and 10-12% of total energy should be derived from protein.

Combat Ration One Man 1975/76 PP Phase I

Menus A-E of this ration as analysed provided 13,490, 13,830, 14,000, 13,270 and 13,440 kJ respectively. Percentages of energy contributed by protein, fat and carbohydrate respectively were:

Type A – 8.9 : 27.0 : 64.1
Type B – 8.2 : 29.1 : 62.6
Type C – 10.9 : 29.0 : 60.1
Type D – 9.7 : 30.7 : 59.6
Type E – 10.1 : 33.2 : 56.7

The vitamin B_1 contents were 2.05, 2.05, 1.97, 3.04 and 2.95 mg respectively. Vitamin C contents were 25.1, 23.1, 15.3, 27.3 and 23.6 mg respectively.

PNG Ration One Man 1975/76 PP Phase I

This ration was found to provide 12,220, 13,140, 12,300 and 12,700 kJ for Menus A-D respectively. Percentages of energy contributed by protein, fat and carbohydrate respectively, were:

Type A – 11.8 : 21.0 : 67.2
Type B – 11.5 : 28.0 : 60.5
Type C – 8.9 : 24.7 : 66.4
Type D – 12.7 : 22.1 : 65.3

Vitamin B_1 contents were 21.24, 21.00, 20.84 and 20.99 mg respectively. Vitamin C contents were 19.8, 83.3, 80.3 and 19.8 mg respectively.

Patrol Ration One Man 1975/76 PP Phase I

Menus A-C were found to provide 12,540, 13,320 and 12,940 kJ respectively. Percentages of energy provided by protein, fat and carbohydrate respectively, were:

Type A – 23.1 : 20.6 : 56.3
Type B – 20.4 : 28.3 : 51.3
Type C – 22.5 : 23.8 : 53.7

Vitamin B_1 contents were 2.43, 3.73 and 4.59 mg respectively. Vitamin C contents were 60.2, 60.5 and 71.7 mg respectively.

Emergency Flying Ration

The energy value of this ration was found to be 12,160 kJ. Percentages of energy provided by protein, fat and carbohydrate respectively were 15.3 : 29.5 : 55.2.

Vitamin B_1 content was 8.87 mg; vitamin C content was 153.3 mg.

DISCUSSION

Combat Ration One Man

All the menus of this ration provide approximately the recommended energy level. Menu D is marginally below this value (by 200 kJ) but this is not seen as a significant deficiency.

All menus provide approximately 1,000 kJ less energy than did the Combat Ration One Man 1974/75 packaging programme (AFFSE 1/76) and it is recommended that no further reduction should occur.

The proportion of energy provided by protein is slightly below the recommended 10-12% in menus A and B; this result was also obtained last year (AFFSE 1/76). The amount of protein provided by Menus A and B is borderline. Thomas and Corden (1970) recommend 70 g; Menu A provides 71.5 g and Menu B provides 68 g. Last year's recommendation (AFFSE 1/76) that Menus A and B should be altered to provide 10-12% of their energy as protein is repeated here.

All menus provide adequate vitamin B_1.

All menus are deficient in vitamin C. The Combat Ration One Man from the 1974/75 packaging programme included candy creamy fudge and instant coffee, both of which had high levels of vitamin C. Candy creamy fudge is not included in the present ration and the instant coffee was found to have no vitamin C. Australian Defence Force Food Specifications require coffee and chocolate to be vitamin fortified.

The previous year's ration provided between 70 and 116 mg of vitamin C.

PNG Ration

Three of the Menus, A, C and D were found to be deficient by about 1,000 kJ in total energy. Menu B was about 250 kJ short of the recommended level.

The proportion of energy derived from protein is acceptable in Menus A, B and D but is low in C. However, this menu still provides more than the minimum requirement (81.6 g compared to 70 g minimum). This is considered to be adequate, but any further decrease would be undesirable.

The vitamin B_1 level is excessive by a factor of 10. While excess thiamine is not harmful, the ration is unbalanced in providing more thiamine than is required and less total energy than is recommended.

The vitamin C contents of Menus A and D are very low, while those of Menus B and C are adequate. The difference is the inclusion of fruit candies fortified with vitamin C in Menus B and C.

It is recommended that the level of vitamin C be increased in Menus A and D. This should be achieved by correct fortification of instant coffee and chocolate as required by ADFFS. Alternatively, fruit candies could be made a common item, as was suggested last year.

Patrol Ration One Man

The samples as analysed reveal that Menus A and C are slightly deficient in total energy value (A by 850 kJ, C by 450 kJ). Menu B provides adequate total energy.

Each menu derives an excessively high percentage of total energy from protein (about 20%, compared to the recommended 10-12%). As the metabolism of protein requires considerable water, the consumption of this ration could lead to thirst problems, as has been previously pointed out (AFFSE 1/76). This would tend to negate the value of having dehydrated lightweight components, as additional water would be needed by each man to quench his "additional" thirst.

The major problem is in the main meal items which have a large meat component. This problem is to be investigated further with a view to reducing the high protein levels.

Vitamin B_1 levels were found to be adequate. Vitamin C levels were also satisfactory.

Emergency Flying Ration

This ration as analysed was found to provide less energy than recommended by about 1,250 kJ. However, this is unlikely to lead to serious problems because of the expected time-scale of use of this ration (a maximum of 4 days before rescue).

The proportion of energy derived from protein is somewhat high at 15% and this could lead to thirst problems, particularly at sea where no fresh water is available.

Levels of vitamins B_1 and C were adequate.

It is recommended that the protein level of this ration be altered to conform to the recommended daily allowance.

GENERAL

The results indicate that some rations are becoming nutritionally unbalanced. The most serious problems are low vitamin C levels in the Combat Ration One Man and in two Menus of the PNG Ration.

Energy deficiencies are also apparent, particularly in the PNG Ration, but also in the Patrol Ration One Man.

An excess of protein in the Patrol Ration One Man and the Emergency Flying Ration could lead to thirst problems.

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Annex A

COMBAT RATION (ONE MAN)

1975/76 PACKAGING PROGRAMME – PHASE II

COMPONENT	NET WEIGHT g	COMPOSITION (%)					VITAMIN mg/PACK		kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
ITEMS COMMON TO ALL RATION TYPES									
Cereal Block	57.5	5.1	21.0	0.8	8.2	0.3	–	0.037	1,158
Biscuits – Survival	90.2	2.5	13.1	1.7	10.5	1.1	–	0.054	1,691
Biscuits – Shortbread	87.5	3.5	20.9	1.4	6.1	0.8	–	0.016	1,774
Cheese	41.0	40.2	23.8	6.4	19.9	2.8	–	0.027	571
Chocolate	40.3	3.9	27.0	0.6	8.4	0.3	Nil	1.48	871
Chewing Gum	15.3	3.06	–	–	–	–	–	–	248
Candy Creamy Fudge	84.8	6.0	8.5	Nil	2.45	0.1	Nil	Nil	1,482
Condensed Milk (Sweet)	64.0	19.1	7.1	1.9	9.2	0.4	2.2	0.054	941
Sugar	83.0	–	–	–	–	–	–	–	1,386
Tea Bags	3.78	–	–	–	–	–	–	–	–
Coffee Instant	7.26	3.3	–	8.3	20.9	0.3	Nil	0.134	107
Salt	7.1								
TOTAL						g/pack 10.5	2.2	1.81	10,229
MENU – TYPE A									
Ham and Egg Ration	119.0	76.4	8.0	2.0	12.2	1.0	–	0.217	631
Curry Powder	3.4	7.8	10.9	8.7	15.9	3.7	–	–	55
Beef and Vegetables	218.2	73.3	5.6	1.7	7.3	0.9	Nil	Nil	1,168
Pre-cooked Rice	58.0	8.7	0.1	0.3	Nil	Nil	–	0.027	878
Plum Jam	23.4	23.3	–	–	–	–	8.1	–	300
Fruit Juice Powder (Orange)	13.9	0.4	–	0.5	–	Nil	14.8	–	230
TOTAL (including common items)						g/pack 13.79	25.1	2.05	13,491

COMBAT RATION (ONE MAN) (Cont'd.)

1975/76 PACKAGING PROGRAMME – PHASE II

COMPONENT	NET WEIGHT g	COMPOSITION (%)					VITAMIN mg/PACK		kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
MENU – TYPE B									
Pork and Beans	108.3	67.6	12.7	2.7	7.5	1.7	Nil	0.172	827
Curry Powder	3.4	7.7	10.9	8.7	15.9	3.70	–	–	55
Corned Beef Hash	230.6	73.5	7.8	2.1	8.2	1.3	–	0.042	1,320
Pre-Cooked Rice	57.8	8.7	0.1	0.3	Nil	Nil	–	0.027	878
Raspberry Jam	23.2	23.5	–	–	–	–	7.5	–	296
Fruit Juice Powder (Lemon)	13.6	0.3	–	0.4	–	Nil	13.4	–	226
TOTAL (including common items)						g/pack 15.4	23.1	2.05	13,831
MENU – TYPE C									
Luncheon Meat Type II	105.9	68.1	8.5	2.0	10.4	1.3	–	0.062	718
Curry Powder	3.4	7.7	10.9	8.7	15.9	3.7	–	–	55
Beef with Gravy	227.1	68.58	10.3	2.2	17.3	1.3	–	0.073	1,600
Pre-Cooked Rice	57.8	8.7	0.1	0.3	Nil	Nil	–	0.027	878
Apricot Jam	23.1	22.0	–	–	–	–	9.9	–	302
Fruit Juice Powder (Lime)	12.8	0.3	–	0.6	–	Nil	3.2	–	214
TOTAL (including common items)						g/pack 14.9	15.3	1.97	13,996

COMBAT RATION (ONE MAN) (Cont'd.)

1975/76 PACKAGING PROGRAMME – PHASE II

COMPONENT	NET WEIGHT g	COMPOSITION (%)					VITAMIN mg/PACK		kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
MENU – TYPE D									
Sausages and Vegetables	118.0	79.4	4.1	2.0	3.8	1.1	Nil	0.038	662
Soup Powder Beef	14.2	3.9	0.3	19.4	0.9	12.9	Nil	0.946	196
Luncheon Meat	216.0	65.9	13.0	3.6	14.8	2.1	–	0.246	1,691
Blackberry Jam	23.1	22.4	–	–	–	–	10.3	–	299
Fruit Juice Powder (Orange)	13.9	0.4	–	0.5	–	Nil	14.7	–	230
TOTAL (including common items)						g/pack 18.0	27.3	3.04	13,267
MENU – TYPE E									
Beef and Egg Ration	110.2	71.5	11.4	2.4	14.2	1.3	–	0.061	744
Soup Powder Chicken	14.0	3.7	0.7	16.9	Nil	11.3	Nil	0.995	187
Corned Beef	219.7	65.8	14.1	3.8	11.5	2.3	–	0.086	1,763
Peach Jam	22.7	22.8	–	–	–	–	8.0	–	293
Fruit Juice Powder (Lemon)	13.6	0.3	–	0.4	–	Nil	13.4	–	226
TOTAL (including common items)						g/pack 18.6	23.6	2.95	13,443

PNG RATION – ONE MAN

1975/76 PACKAGING PROGRAMME – PHASE I

COMPONENT	NET WEIGHT g	COMPOSITION (%)							kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
ITEMS COMMON TO ALL RATION TYPES									
Ration Biscuits	93.4	7.2	11.5	2.4	10.3	1.0	–	0.053	1,629
Pre-cooked Rice	258.8	8.2	0.1	0.3	6.3	Nil	–	18.110	3,964
Chocolate	51.5	3.4	25.8	1.7	9.4	0.2	17.5	2.430	1,098
Tea Bags	2.1	–	–	–	–	–	–	–	–
Salt	6.7	–	–	–	–	98.5	–	–	–
Chewing Gum	15.7	3.1	–	–	–	–	–	–	254
Instant Coffee	7.1	3.3	–	8.3	20.9	0.3	Nil	0.130	105
Sugar	85.6	–	–	–	–	–	–	–	1,430
TOTAL						g/pack 7.8	17.5	20.72	8,480
MENU – TYPE A									
Ham and Egg Ration	113.3	76.4	8.0	2.0	12.2	1.0	–	0.206	600
Potato and Onion Powder	30.0	4.1	10.0	3.4	12.3	0.4	Nil	0.021	526
Luncheon Meat Type I	207.4	65.9	13.0	3.6	14.8	2.1	–	0.236	1,623
Condensed Milk Sweet	67.4	19.1	7.1	1.9	9.2	0.4	2.3	0.057	990
TOTAL (including common items)						g/pack 13.655	19.8	21.24	12,219

PNG RATION – ONE MAN (Cont'd.)

Annex B (Cont'd.)

1975/76 PACKAGING PROGRAMME – PHASE I

COMPONENT	NET WEIGHT g	COMPOSITION (%)					VITAMIN mg/PACK		kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
MENU – TYPE B									
Pork and Beans	116.9	71.2	5.9	2.8	10.8	1.9	3.5	0.212	655
Butter Concentrate	23.7	0.1	93.0	2.6	2.3	2.1	–	–	847
Tuna	183.3	50.6	24.3	1.2	24.6	0.4	–	0.031	2,434
Fruit Candies	43.5	1.0	–	–	–	–	62.8	–	719
TOTAL (including common items)						g/pack 11.0	83.8	21.00	13,135
MENU – TYPE C									
Beef and Egg	118.2	71.5	11.4	2.4	14.2	1.3	–	0.065	808
Butter Concentrate	23.7	0.1	93.0	2.6	2.3	2.1	–	–	847
Corned Beef	219.8	68.8	9.5	3.8	14.5	2.0	–	0.048	1,444
Fruit Candies	43.5	1.0	–	–	–	–	62.8	–	719
TOTAL (including common items)						g/pack 14.1	80.3	20.84	12,298
MENU – TYPE D									
Luncheon Meat – Type II	109.5	68.4	11.9	2.0	12.3	1.0	–	0.093	816
Potato and Onion Powder	30.0	4.1	10.0	3.4	12.3	0.4	Nil	0.021	526
Beef and Gravy	233.3	65.1	12.6	2.4	17.4	1.3	–	0.100	1,884
Condensed Milk Sweet	67.4	19.1	7.1	1.9	9.2	0.4	2.3	0.057	990
TOTAL (including common items)						g/pack 12.5	19.8	20.99	12,696

EMERGENCY FLYING RATION RAAF 1975/76

PACKAGING PROGRAMME PKD AUGUST 75

COMPONENT	NET WEIGHT g	COMPOSITION (%)					VITAMIN mg/PACK		kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
Ration Biscuits	79.7	3.3	12.7	2.6	17.6	1.2	–	0.043	1,464
Cereal Block	114.8	4.8	20.3	1.9	14.8	0.2	–	0.069	2,278
Chocolate	153.6	3.5	27.1	1.8	15.3	0.2	24.3	8.189	3,302
Milk Powder	6.6	3.1	0.8	8.9	39.6	1.8	Nil	0.031	97
Soup Cubes	25.2	2.3	11.5	62.4	15.7	50.9	7.3	0.014	209
Sugar	33.7	–	–	–	–	–	–	–	563
Cheese	32.4	41.9	25.4	6.3	21.1	2.3	–	0.014	454
Coffee Soluble	7.0	4.4	–	10.2	20.0	0.2	12.6	0.488	100
Butterscotch	72.9	1.6	0.8	1.1	0.2	0.5	Nil	–	1,198
Salt	7.4	–	–	–	–	98.5	–	–	–
Beef Block	54.9	4.0	15.3	4.5	76.1	0.5	–	0.025	1,016
Fruit Candies	89.8	1.7	–	–	–	–	109.2	–	1,476
TOTAL						g/pack 15.9	153.3	8.87	12,156

PATROL RATION (ONE MAN) LIGHT WEIGHT

1975/76 PACKAGING PROGRAMME – PHASE I

COMPONENT	NET WEIGHT g	COMPOSITION (%)					VITAMIN mg/PACK		kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
COMMON TO ALL RATION									
d Cheese Sticks	22.0	43.1	26.1	6.2	20.4	2.6	–	0.018	614
Milk	30.8	4.0	1.0	7.8	37.9	1.3	Nil	0.135	459
Creamy Fudge	84.4	6.1	8.8	0.6	1.4	0.2	15.1	–	1,469
	55.0	1.6	Nil	0.4	8.2	Nil	–	Nil	899
	86.6	–	–	–	–	–	–	–	1,446
Coffee	7.1	6.0	–	12.6	22.1	0.2	28.3	2.05	96
s	3.9	–	–	–	–	–	–	–	–
	7.6	–	–	–	–	98.5	–	–	–
g Gum	15.6	3.0	–	–	–	–	–	–	252
L						g/pack 8.7	43.4	2.20	5,235
– TYPE A									
eef and Onions	107.8	1.8	7.1	6.7	63.2	3.4	Nil	0.103	1,804
avoury Steak Fingers	110.2	2.3	8.1	9.9	61.5	5.3	Nil	0.105	1,804
uice Powder Orange	15.2	0.7	–	8.0	–	1.2	16.8	–	232
rry Crunch	89.7	6.4	16.2	0.8	5.3	0.3	Nil	Nil	1,694
read	87.7	3.5	20.9	1.4	6.1	0.8	–	0.016	1,775
L (including common items)						g/pack 19.3	60.2	2.43	12,544

PATROL RATION (ONE MAN) LIGHT WEIGHT

1975/76 PACKAGING PROGRAMME – PHASE I

COMPONENT	NET WEIGHT g	COMPOSITION (%)					VITAMIN mg/PACK		kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
ITEMS COMMON TO ALL RATION TYPES									
Processed Cheese Sticks	22.0	43.1	26.1	6.2	20.4	2.6	–	0.018	614
Instant Milk	30.8	4.0	1.0	7.8	37.9	1.3	Nil	0.135	459
Candy Creamy Fudge	84.4	6.1	8.8	0.6	1.4	0.2	15.1	–	1,469
Rice	55.0	1.6	Nil	0.4	8.2	Nil	–	Nil	899
Sugar	86.6	–	–	–	–	–	–	–	1,446
Instant Coffee	7.1	6.0	–	12.6	22.1	0.2	28.3	2.05	96
Tea Bags	3.9	–	–	–	–	–	–	–	–
Salt	7.6	–	–	–	–	98.5	–	–	–
Chewing Gum	15.6	3.0	–	–	–	–	–	–	252
TOTAL						g/pack 8.7	43.4	2.20	5,235
MENU – TYPE A									
F.D. Beef and Onions	107.8	1.8	7.1	6.7	63.2	3.4	Nil	0.103	1,804
F.D. Savoury Steak Fingers	110.2	2.3	8.1	9.9	61.5	5.3	Nil	0.105	1,804
Fruit Juice Powder Orange	15.2	0.7	–	8.0	–	1.2	16.8	–	232
Raspberry Crunch	89.7	6.4	16.2	0.8	5.3	0.3	Nil	Nil	1,694
Shortbread	87.7	3.5	20.9	1.4	6.1	0.8	–	0.016	1,775
TOTAL (including common items)						g/pack 19.3	60.2	2.43	12,544

PATROL RATION (ONE MAN) LIGHT WEIGHT (Cont'd.)

1975/76 PACKAGING PROGRAMME – PHASE I

COMPONENT	NET WEIGHT g	COMPOSITION (%)					VITAMIN mg/PACK		kJ PER PACK
		WATER	FAT	ASH	PROTEIN	SALT	C	B_1	
MENU – TYPE B									
F.D. Beef and Beans	110.0	1.6	15.1	6.9	54.7	3.4	Nil	0.139	2,028
F.D. Roast Sliced Pork	106.7	1.5	25.7	4.0	59.9	1.1	–	1.355	2,260
Fruit Juice Powder Lemon	14.4	Nil	–	0.8	–	Nil	17.1	–	238
Shortbread	175.3	3.5	20.9	1.4	6.1	0.8	–	0.032	3,555
TOTAL (including common items)						g/pack 14.9	60.5	3.73	13,316
MENU – TYPE C									
F.D. Lamb and Vegetable Curry	108.3	1.8	16.8	4.3	59.9	1.2	Nil	0.186	2,082
F.D. Sweet and Sour Pork	108.6	2.3	6.9	4.3	65.5	0.8	12.8	2.171	1,851
Fruit Juice Powder Lime	13.2	0.2	–	0.8	–	Nil	15.5	–	218
Shortbread	175.3	3.5	20.9	1.4	6.1	0.8	–	–	3,555
TOTAL (including common items)						g/pack 8.7	71.7	4.59	12,941

PROPORTION OF ENERGY PROVIDED BY PROTEIN, FAT AND CARBOHYDRATE

COMBAT RATION (ONE MAN) – 1975/76 PHASE I

COMPONENT	PROTEIN kJ	FAT kJ	CHO kJ	TOTAL kJ
COMMON ITEMS				
Cereal Block	79	455	624	1,158
Survival Biscuits	159	445	1,087	1,691
Shortbread	88	691	995	1,774
Cheese	136	368	67	571
Chocolate	56	411	404	871
Chewing Gum	–	–	248	248
Candy Creamy Fudge	35	271	1,176	1,482
Sweetened Condensed Milk	99	172	670	941
Sugar	–	–	1,386	1,386
Tea Bags	–	–	–	–
Instant Coffee	25	–	82	107
Salt	–	–	–	–
TOTAL ENERGY DISTRIBUTION	677	2,813	6,739	10,229
% Energy Distribution	6.6	27.5	65.9	
MENU – TYPE A				
Ham and Egg Ration	242	359	30	631
Plum Jam	–	–	300	300
Curry Powder	9	14	32	55
Beef and Vegetables	266	457	445	1,168
Instant Rice	–	2	876	878
Fruit Juice Powder – Orange	–	–	230	230
Common Items	677	2,813	6,739	10,229
TOTAL ENERGY DISTRIBUTION	1,194	3,645	8,652	13,491
% Energy Distribution	8.9	27.0	64.1	
MENU – TYPE B				
Pork and Beans	136	520	171	827
Curry Powder	9	14	32	55
Corned Beef Hash	316	680	324	1,320
Pre-cooked Rice	–	2	876	878
Raspberry Jam	–	–	296	296
Fruit Juice Powder Lemon	–	–	226	226
Common Items	677	2,813	6,739	10,229
TOTAL ENERGY DISTRIBUTION	1,138	4,029	8,664	13,831
% Energy Distribution	8.2	29.1	62.6	

PROPORTION OF ENERGY PROVIDED BY PROTEIN, FAT AND CARBOHYDRATE

COMBAT RATION (ONE MAN) – 1975/76 PHASE I (Cont'd.)

COMPONENT	PROTEIN kJ	FAT kJ	CHO kJ	TOTAL kJ
MENU – TYPE C				
Luncheon Meat Type II	185	341	192	718
Curry Powder	9	14	32	55
Beef with Gravy	656	884	60	1,600
Pre-cooked Rice	–	2	876	878
Apricot Jam	–	–	302	302
Fruit Juice Powder Lime	–	–	214	214
Common Items	677	2,813	6,739	10,229
TOTAL ENERGY DISTRIBUTION	1,527	4,054	8,415	13,995
% Energy Distribution	10.9	29.0	60.1	
MENU – TYPE D				
Sausages and Vegetables	76	184	362	622
Soup Powder Beef	2	16	178	196
Luncheon Meat	536	1,055	100	1,691
Blackberry Jam	–	–	299	299
Fruit Juice Powder Orange	–	–	230	230
Common Items	677	2,813	6,739	10,229
TOTAL ENERGY DISTRIBUTION	1,290	4,069	7,908	13,267
% Energy Distribution	9.7	30.7	59.6	
MENU – TYPE E				
Beef and Egg Ration	261	475	8	744
Soup Powder Chicken	–	4	184	188
Corned Beef	420	1,165	178	1,763
Peach Jam	–	–	293	293
Fruit Juice Powder Lemon	–	–	226	226
Common Items	677	2,813	6,739	10,229
TOTAL ENERGY DISTRIBUTION	1,358	4,457	7,628	13,443
% Energy Distribution	10.1	33.2	56.7	

PROPORTION OF ENERGY PROVIDED BY PROTEIN, FAT AND CARBOHYDRATE

PNG RATION 1975/76 PHASE I

COMPONENT	PROTEIN kJ	FAT kJ	CHO kJ	TOTAL kJ
COMMON ITEMS				
Survival Biscuits	160	403	1,066	1,629
Rice	272	6	3,686	3,964
Chocolate	81	502	515	1,098
Instant Coffee	25	–	80	105
Chewing Gum	–	–	254	254
Salt	–	–	–	–
Sugar	–	–	1,430	1,430
Tea Bags	–	–	–	–
TOTAL ENERGY DISTRIBUTION	538	911	7,031	8,430
% Energy Distribution	6.3	10.7	82.9	
MENU – TYPE A				
Ham and Egg Ration	230	342	28	600
Potato and Onion Powder	61	113	352	526
Luncheon Meat Type I	513	1,014	96	1,623
Condensed Milk Sweetened	104	181	705	990
Common Items	538	911	7,031	8,480
TOTAL ENERGY DISTRIBUTION	1,446	2,561	8,212	12,219
% Energy Distribution	11.8	21.0	67.2	
MENU – TYPE B				
Pork and Beans	210	262	183	655
Butter Concentrate	9	830	8	847
Tuna	752	1,682	–	2,434
Fruit Candies	–	–	719	719
Common Items	538	911	7,031	8,480
TOTAL ENERGY DISTRIBUTION	1,509	3,685	7,941	13,135
% Energy Distribution	11.5	28.0	60.5	

PROPORTION OF ENERGY PROVIDED BY PROTEIN, FAT AND CARBOHYDRATE

PNG RATION 1975/76 PHASE I (Cont'd.)

COMPONENT	PROTEIN kJ	FAT kJ	CHO kJ	TOTAL kJ
MENU – TYPE C				
Beef and Egg	9	510	289	808
Butter Concentrate	9	830	8	847
Corned Beef	534	785	125	1,444
Fruit Candies	–	–	719	719
Common Items	538	911	7,031	8,480
TOTAL ENERGY DISTRIBUTION	1,090	3,036	8,172	12,298
% Energy Distribution	8.9	24.7	66.4	
MENU – TYPE D				
Luncheon Meat Type II	225	493	98	816
Potato and Onion Powder	61	113	352	526
Beef and Gravy	679	1,106	99	1,884
Condensed Milk Sweet	104	181	705	990
Common Items	538	911	7,031	8,480
TOTAL ENERGY DISTRIBUTION	1,607	2,804	8,285	12,696
% Energy Distribution	12.7	22.1	65.3	

PROPORTION OF ENERGY PROVIDED BY PROTEIN, FAT AND CARBOHYDRATE

PATROL RATION (ONE MAN) – 1975/76 PHASE I

COMPONENT	PROTEIN kJ	FAT kJ	CHO kJ	TOTAL kJ
COMMON ITEMS				
Processed Cheese Sticks	150	433	31	614
Instant Milk	195	12	252	459
Candy Creamy Fudge	20	279	1,170	1,469
Rice	75	–	824	899
Sugar	–	–	1,446	1,446
Instant Coffee	26	–	70	96
Tea Bags	–	–	–	–
Salt	–	–	–	–
Chewing Gum	–	–	252	252
TOTAL ENERGY DISTRIBUTION	466	724	4,045	5,235
% Energy Distribution	8.9	13.8	77.3	
MENU – TYPE A				
F.D. Beef and Onions	1,138	284	382	1,804
F.D. Savoury Steak Fingers	1,131	337	336	1,804
Fruit Juice Powder Orange	–	–	232	232
Raspberry Crunch	79	548	1,067	1,694
Shortbread	88	691	996	1,775
Common Items	466	724	4,045	5,235
TOTAL ENERGY DISTRIBUTION	2,902	2,584	7,058	12,544
% Energy Distribution	23.1	20.6	56.3	
MENU – TYPE B				
F.D. Beef and Beans	1,004	625	399	2,028
F.D. Roast Sliced Pork	1,067	1,033	160	2,260
Fruit Juice Powder Lemon	–	–	238	238
Shortbread	178	1,384	1,993	3,555
Common Items	466	724	4,045	5,235
TOTAL ENERGY DISTRIBUTION	2,715	3,766	6,835	13,316
% Energy Distribution	20.4	28.3	51.3	

PROPORTION OF ENERGY PROVIDED BY PROTEIN, FAT AND CARBOHYDRATE

PATROL RATION (ONE MAN) – 1975/76 PHASE I (Con't)

COMPONENT	PROTEIN kJ	FAT kJ	CHO kJ	TOTAL kJ
MENU – TYPE C				
F.D. Lamb and Vegetable Curry	1,084	686	312	2,082
F.D. Sweet and Sour Pork	1,188	283	380	1,851
Fruit Juice Powder Lime	–	–	218	218
Shortbread	178	1,384	1,993	3,555
Common Items	466	724	4,045	5,235
TOTAL ENERGY DISTRIBUTION	2,916	3,077	6,948	12,941
% Energy Distribution	22.5	23.8	53.7	

PROPORTION OF ENERGY PROVIDED BY PROTEIN, FAT AND CARBOHYDRATE

EMERGENCY FLYING RATION 1975/76 PKD AUG 75

COMPONENT	PROTEIN kJ	FAT kJ	CHO kJ	TOTAL kJ
Ration Biscuits	234	382	848	1,464
Cereal Block	283	877	1,118	2,278
Chocolate	392	1,567	1,343	3,302
Milk Powder	43	2	52	97
Soup Cubes	66	109	34	209
Sugar	–	–	563	563
Cheese	114	310	30	454
Coffee Soluble	23	–	77	100
Butterscotch	3	23	1,172	1,198
Salt	–	–	–	–
Beef Block	698	317	1	1,016
Fruit Candies	–	–	1,474	1,476
TOTAL ENERGY DISTRIBUTION	1,856	3,587	6,712	12,156
% Energy Distribution	15.3	29.5	55.2	